Faculty of Engineering
Mansoura University

Electrical Power & Machines Engineering M.Sc. Program Specification

Contents

Electrical Power & Machines Engineering

M.Sc. Program Specification

1. Introduction

1.1 Basic Information

Program Title: Electrical Power & Machines Engineering

Program Type: Single

Department: Electrical Engineering

Coordinator: Prof. Magdi Mohamed Ali Elsaadawi

Assistant Coordinator: Dr. Ebrahim Abdel-Ghaffar Badran

Dates of Program Specification Approval : 17-10 -2010

1.2 Staff Members:

The Electrical Power & Machines Engineering Program is taught by **26** highly qualified staff members. All of them are full time employed. **Appendix 1** shows the staff members' names, resume and the subjects taught by each of them.

1.3 Internal and External Evaluators:

The program was evaluated by external and internal evaluators. Them evaluation showed that the program specification agrees with the National Academic Reference Standards, as shown in **Appendix 2**.

2. Professional Data

2.1 Preamble

The Department of Electrical Engineering offers a wide selection of graduate courses and activities leading to the degrees of Master of Science (M.S.).

These programs allow students to choose a program of study suited to their interests, individual needs and talents. The programs are broad in perspective and maintain a balance between scholarly excellence and practical relevance.

The programs are oriented towards strengthening the student's background in the area of their specialization but are so designed as to deepen their understanding in one or more selected areas in electrical engineering. Particular emphasis is placed on developing research potential, fostering and encouraging original research and professional competence in the field of concentration The Department of Electrical Engineering currently offers graduate courses and research activities in a variety of areas that span the full breadth of Electrical Power and Machines.

2.2. Program mission and Aims

2.2.1 Program vision and mission and objectives

Vision:

To be a leading centre of excellence in the generation and application of electrical power and machine knowledge.

Mission

To provide:

(i) Top quality education in electrical engineering at postgraduate level;

(ii) Top quality applied research in electrical engineering with abundant publications in the best international journals; and

(iii) Top quality professional service to industry and local community.

Objectives

The department commits itself to the achievement of objectives within the bounds provided by vision and goals of NARS. Major objectives set for the next five years are:-

- To provide quality education at Post Graduate levels

- To implement professionally accredited academic programs in electrical power and machine by using holistic curriculum through a learning process based on experience.
- To promote faculty as a well known reference centre through learning, research and consultancy activities in electrical power and machine field.
- To Assist in the creation of world class technologies by Egyptian Companies
- To Increase research intensity and become a leading product innovation centre in electrical Engineering area
- To Design optimization of power apparatus and develop energy management systems

2.2.2 Program Aims

The graduate of the master program must be able to:

1. Master the basics and methodologies of scientific research and apply the analytical approach in the field of electrical engineering.
2. Plan and manage engineering activity during the diverse phases of electric power generation, transmission and distribution
3. Design and supervise the construction of systems to generate, transmit, distribution and use electrical energy
4. Investigate, plan and execute technical research over an extended period of time; meeting deadlines and putting technical work in a social and commercial context.
5. Acquire the required depth in electrical power and machines engineering subjects necessary for professionally performing engineering jobs.
6. The ability to work within defined constraints, tackle work which lacks a well-defined outcome or which has a wide range of possible solutions and exhibit creativity in dealing with unfamiliar real-life problems.
7. The ability to work in a team, search published sources of information, interpret technical data, analyze, and present findings in various ways.
8. Assess software to support engineering activity and validate results and create software as required in his specialist.
9. Display professional responsibilities and societal of Electrical Engineering and recognize the need to engage in self and continuous learning.

2.3 Intended Learning Outcomes (ILO's)

2.3.1 Knowledge and Understanding

With the completion of the master program, the graduate will have knowledge and understanding in:

A1. Engineering knowledge and creative, iterative and open-ended procedures when conceiving and developing components, systems and processes.
A2. Knowledge of current practice, engineering codes and design techniques relevant to electrical power and machines.
A3. Integrate engineering knowledge, engineering codes, basic and mathematical sciences in designing a component, a system or a process.
A4. Theories, concepts and specialized knowledge of the electrical power and machines area
A5. Sciences appropriate to electrical power and machines.
A6. Scientific developments in the field of electrical power and machines.
A7. Moral and legal ethics of the professional practice in the area of electrical power and machines
A8. Concepts and principles of quality of the professional practice in the area of Electrical Engineering.
A9. Basics and ethics of scientific research.

2.3.2 Intellectual Skills

With the completion of the master program, the graduate will be able to:

B.1. Analyze and evaluate of information in the field of electrical power and machines and make full use of such information to solve problems.
B.2. Demonstrate a high level of competence in the coordination of different sources of knowledge to solve professional problems.
B.3. Carry out a research study and / or writing a scientific methodology study on research problem.
B.4. Plan to improve performance in the field of electrical power and machines.
B.5. Make career decisions in different professional aspects
B.6. Present, evaluate, and interpret qualitative and quantitative data to develop lines of argument and make sound judgments in accordance with basic theories, concepts and know-how within the discipline

B.7. Solve problems, even with limited or contradictory data, taking into concern different constraints, such as economy, safety, quality, environmental impacts and ethics.

2.3.3 Professional Skills

With the completion of the master program, the graduate will be able to:

C.1. Apply modern and principle professional skills in the area of electrical power and machines
C.2. Adopt assessment methods and tools existing in the area of electrical power and machines
C.3. Use tools, techniques, equipment and software relevant to electrical power and machines area
C.4. Develop, promote and apply reliable systems of work related to the profession
C.5. Write and evaluate technical reports.
C.6. Work under stress, taking into account time, economy, health and safety, social and environmental factors and binding laws

2.3.4 General and Transferable Skills

With the completion of the post graduate diploma program, the graduate will be able to:

D.1. Communicate effectively in different aspects.
D.2. Demonstrate efficient IT capabilities in such a way that serves in the development of the professional practice.
D.3. Adopt self-assessment and specify his needs of personal learning.
D.4. Use different resources for information and knowledge.
D.5. Demonstrate a high level of competence in the time management.
D.6. Improving own learning and performance
D.7. Refer to relevant literatures from different scientific resources.
D.8. Acquire entrepreneurial skills.

2.4 Curriculum Structure and Contents

2.4.1 Program Contents:

The program duration is **two** years minimum. The following are the subjects taught during this program.

Code	Course Name	Teaching Hours				Wr. Exam Dur.	Marking			
		Lectures	Exercises	Practical	Total Hours		Year Work	Practical Exam	Written Exam	Total
5701	Advanced analysis of electrical machines	2			2	3			100	100
5702	special electrical machines	2			2	3			100	100
5703	Numerical Analysis for Electromagnetics	2			2	3			100	100
5706	Electrical Gas Discharge	2			2	3			100	100
5707	High voltage engineering	2			2	3			100	100
5709	Power system analysis	2			2	3			100	100
5710	Principles of Electromechanical and Static Relays	2			2	3			100	100
5711	Lighting system	2			2	3			100	100
5713	Electric traction	2			2	3			100	100
5716	Power System Modeling	2			2	3			100	100
5717	Energy Conversion	2			2	3			100	100
5718	Renewable Energy Systems	2			2	3			100	100
5720	power system planning	2			2	3			100	100
5721	power system planning	2			2	3			100	100
5722	Reliability of Energy System	2			2	3			100	100
5723	Optimal operation of electrical power system	2			2	3			100	100
5724	Power electronics	2			2	3			100	100
5725	Control of electrical machines	2			2	3			100	100
5648	Research Study	2			2	Disc			100	100
5700a	Computer Application	2			2	3			100	100
5700b	English language	2			2	3			100	100
Total										

2.4.2 Curriculum Mapping

Appendix 3 gives the contribution of the individual courses to the program Intended Learning Outcomes in a matrix form. This matrix was developed by the program coordinator, assistant coordinators and professional staff members. The mapping matrix shows that the program courses present balanced contribution to the program ILO's includes also two tables summarizing the program ILO's contributed by the individual courses and the courses contributing to the individual ILO's.

2.4.3 Courses Specifications

The detailed program courses specifications are shown in the Curriculum mapping. These courses specifications were revised and approved on 2010. The contribution of each course to the program ILO's were considered during this revision and illustrated in **Appendix 4**.

3. Program Admission Requirements

1. Graduates of college of engineering with electrical engineering or or electrical power and machines engineering are eligible to join this program if they have aminimum grade of "good".
2. The study begins with a general year for all students before registering in a specific research topic based on the department needs and availability.
3. The students should have 2-days per week availability to attend classes.

4. Regulations for Progression and Program Completion

Attendance of program is on full-time basis.

1. During the general year,a minimum of 75% student attendance per course is conditional for taking the final exams in accordance with the faculty rules.
2. The “pass” grade of any course is 60%, “good” grade is 70 %, “very good” is 80%, “excellent grade is 90 % all from the total points
3. The student who fails no more than two courses is reset to examine with fellow-students under taking the course in the following year
4. The supervision of the student is set to a committee from the department that contains at least 2 faculty members at least.
5. One of the supervision committee is a professor or associate professor.
6. The minimum period that the student prepares his thesis is 12 months and the maximum period is 5-years.

7. If the student is failed to finish his thesis in the 5-year, the school can extend this period after request from the supervision committee that clarifies the reason of not meeting the deadlines.
8. There is an annual report from the supervision committee to show the performance of the student.
9. The student is graduated with mater of science in electrical power and machines after passing general discussion successfully.
10. The discussion committee is selected from the supervision committee and approved from the department and then the faculty with at least one external examine,one member from the supervision committee and one internal examine.

Appendix 5 gives the details of program progression and grades evaluation.

5. Student Assessment (Methods and rules for student assessment)

Method (tool)	Assessed ILO's
1- Written exam	A, B & C,D
2- Quizzes and reports	A, B & C
3- Oral exams	A, B & C
4- Practical	A & C
5- Project applied on a practical field problem	A, B, C & D

6. Program Evaluation

Evaluator	Tool
1- Senior students	questionnaire
2- Alumni	questionnaire
3- Stakeholders	questionnaire
4- External Evaluator(s) (External Examiner (s))	report
5- Other societal parties	Non